

Michael's Auto Service Centers, Inc.

Website and Client Service Request Form

Team 9

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Section 1. Project Description

Executive Summary

Section One will go over the Company Background, Program Analysis (BPA, BPI BPR), the System Proposal, the Expected Benefits, the Initial Context Diagram, and the Initial Use-Case Diagram.

For the company background and the current environment, it was discussed with the owner, Michael Bavaro, concerning Michael's Auto Service Center. He is the lead mechanic and chief decision-maker located in Clayton, North Carolina where he services vehicles on a day-to-day basis. He currently uses pen and paper for client invoices, weekly payroll, and simple time management. Due to these causes, Michael's Auto Service Center produces several problems throughout the day. We have come up with the proposal to improve the scheduling system that will integrate with the small business's primary technical resource, AllData, allowing for easier time management and daily business processing. Our group wishes to build an information system that will serve the purposes of the business, integrate with the current system of AllData, and to improve its time management. We hope that in establishing this new system, Michael's Auto Service Center will increase efficiency and profitability.

Company Background & Current Environment

Michael's Auto Service Center is an automobile repair shop, located in downtown Clayton, North Carolina, owned and operated by Michael Bavaro. A veteran and successful businessman, Mr. Bavaro opened Michael's Auto Service Center in 2017 after working as a mechanic under another owner at the same location previously. Mr. Bavaro credits his location, strong work ethic, and honest client communication for the shop's immense success. With Michael's vision and dedication, the location has enjoyed sustained success from the very start, retaining much of the original clientele from the original owner and further expanding his deep client-base as "an awesome individual and as honest as they come" (Facebook Review, January 2021). Michael's stellar service has also earned him high praise from the Clayton Chamber of Commerce as well, in which his shop sports a 5.0 (out of 5) rating. Today, the shop typically completes 6-7 jobs a day, mixing smaller work such as oil changes and tire rotations with larger engine and transmission repair, to optimize their efficiency. Depending on the work required, some clients must wait weeks before they can be scheduled.

Michael's Auto Service Center employs a total of 3 employees, which includes himself as lead mechanic and chief decision-maker, another mechanic, and a part-time client-service representative. The shop operates with just three computer terminals. A central computer that serves as the primary customer contact where customers are greeted, jobs are scheduled, and invoices are printed. A secondary terminal that can be used for customer tracking as well. The third terminal is reserved specifically for the mechanics, located in the main working bay. From this computer, the mechanics can research, order parts, read auto-diagnostics, and browse the Internet. The primary client-service computer also operates the shop's chief auto-repair resource, an installed software that provides part information, work requirements and job instruction, and unique maintenance and repair information for millions of vehicles. AllData is also available to the small business via an online web portal. As a trusted resource for thousands of mechanical repair shops across the United States, this software is regarded as Michael's chief technical resource.

Mr. Bavaro is also an avid auto-enthusiast as he likes to build and race drag cars in his free time. This draws quite a bit of attention to the shop and the services he offers. And while he is just doing the thing

he loves most; it is an incredible marketing campaign that highlights his skills and craftsmanship without any additional overhead. It's free publicity!

Problem Analysis

During our review of Michael's Auto Service Center's current environment and daily processes, we noted a handful of outdated practices that could potentially be addressed for business process automation. Tasks such as client invoicing and weekly payroll are still pen-and-paper based, most likely requiring more time, physical storage, and management problems than a more modern virtual solution may provide.

However, Mr. Bavaro believes his business is critically limited by one key factor, time management. This extends into quite an array of various smaller issues that ultimately limits Michael's efficiency and scheduling capacity, which in turn, limits his profitability. As this was Mr. Bavaro's primary concern, we will focus on business-process improvement (and potentially some business-process automation as well) looking to improve the integration of his primary software, AllData, with a unique calendar program capable of flexible scheduling. This new system would need to account for part availability (inventory management), scheduling constraints, and time requirements.

Because of his extensive knowledge and business expertise, Michael is the only employee capable of reviewing potential jobs and providing the pricing and scheduling for those jobs. This can be difficult as Michael is also one of the skilled mechanics for the auto repair shop and is typically forced to balance his time between scheduling new work and completing scheduled jobs each day. If this process could be simplified (or automated), he would be able to delegate this process to the other employees which would allow him to focus more time on scheduled work, and in turn, maximize the shop's efficiency.

Secondly, scheduling jobs is an immense struggle as already-scheduled work is not accurately detailed, so time-requirements and other circumstances are not provided on the shop's current calendar service (Google Calendars). This forces Michael to review scheduled work for more information on timing and job requirements before he can schedule new jobs. Additionally, any changes to his daily schedule (such as cancellations, extended time on current jobs, or emergency requests) are not captured and can create massive bottlenecks at any given moment, leading to double-booking and client frustration.

Proposed System Objectives & Constraints

Objectives

In understanding Mr. Bavaro's chief concern, we have proposed an improved scheduling system that will integrate with the small business's primary technical resource, AllData, allowing for easier time management and daily business processing. This unique scheduling/calendar system will be designed to serve multiple purposes from the company's primary computer terminal.

First, this information system will serve as the company's calendar and scheduling resource. Our unique scheduling tool is designed to facilitate quicker and easier scheduling for clients and internal tasks.

Secondly, the system will integrate with AllData to provide guidance on job quotes and requirements. This added benefit should not only link Michael's Auto Service Center technology but also build less reliance on the AllData software, as the User should now be able to gather necessary details in one

place. Users will be able to enter several key data points into the scheduling system to output time requirements, necessary parts (and their availability), and estimated job pricing.

With these two basic functions, we would expect our information system to enable other employees to take a more active role in the scheduling process. With the necessary details available to users as they are confirming new auto repair jobs, Mr. Bavaro should no longer be the only employee capable of scheduling jobs, quoting work, and managing the daily workload. And while this new system is primarily directed towards business process improvement, it also bears some process automation as the scheduler should be able to retrieve relevant job details directly from AllData and output the optimal scheduling options for users.

To utilize the new system, employees will take job details from potential customers and enter them directly into the scheduling system. Once key data points have been entered, such as make and model of vehicle and service requested, the scheduling system will reference the database populated or powered by AllData to return job specifications, including details like job duration and expected fee. With this information, the employee can then work with the customer to schedule an appropriate date and time for the requested job. Better tracking of the daily schedule should provide Michael's Auto Service Center with more insight into their daily workload, types of jobs, and important business periods throughout the year. And even more importantly, it should allow the small business to better plan and prepare for future work, ultimately facilitating time management and productivity.

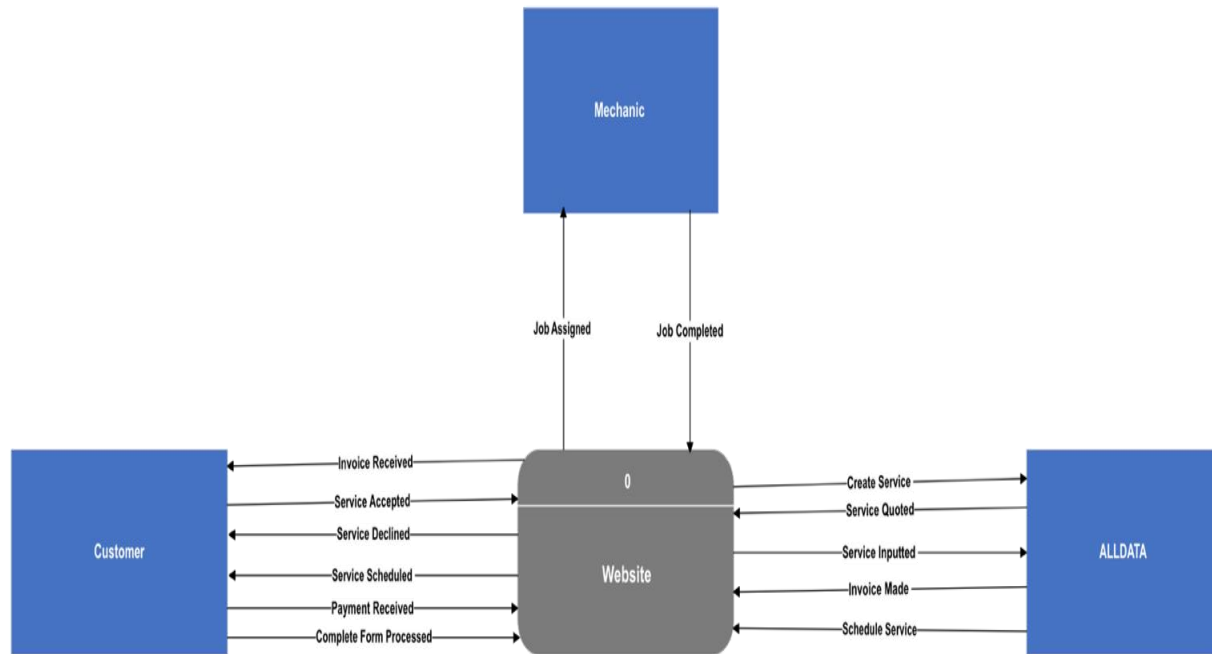
Constraints

One Constraint of the proposed scheduling system is the training time of the employees with the new system. This can take valuable time away from employees working on cars and having to understand and slowly recognize where certain items are in the new system. Once the team is familiar with the new system, the time spent normally just giving customers a proper appointment would now have that appointment and a quote in the same amount of time or less. Another constraint of this proposed system is user error. All input information must be correct. Because Michael himself is used to doing all the quotes and scheduling, this might be a learning curve for those that aren't familiar with inputting information into the system, and therefore can lead to mistakes. User error occurs in all lines of work and can be expected to eventually work out after a few times of using the system, and familiarizing where information should go, and the content of the information is known. A final constraint is time. This project has a limited number of days to be completed. This limits the overall depth our project can go in terms of details, as it must be a fully operating system by the end of Sprint 6.

Expected Benefits

With this new unique scheduling system, we expect Michael's Auto Service Center to experience better efficiency leading to optimal utilization of working bays and increased profitability. The new scheduling system should also allow Mr. Bavaro to delegate more scheduling and quoting by other shop employees so that he can better focus on completing scheduled jobs. There would also be some potential for slight automation within the scheduling system as we hope to integrate the shop's other internal technical resources and limit the need for Michael to facilitate the process.

Context Diagram



Section 2. Analysis

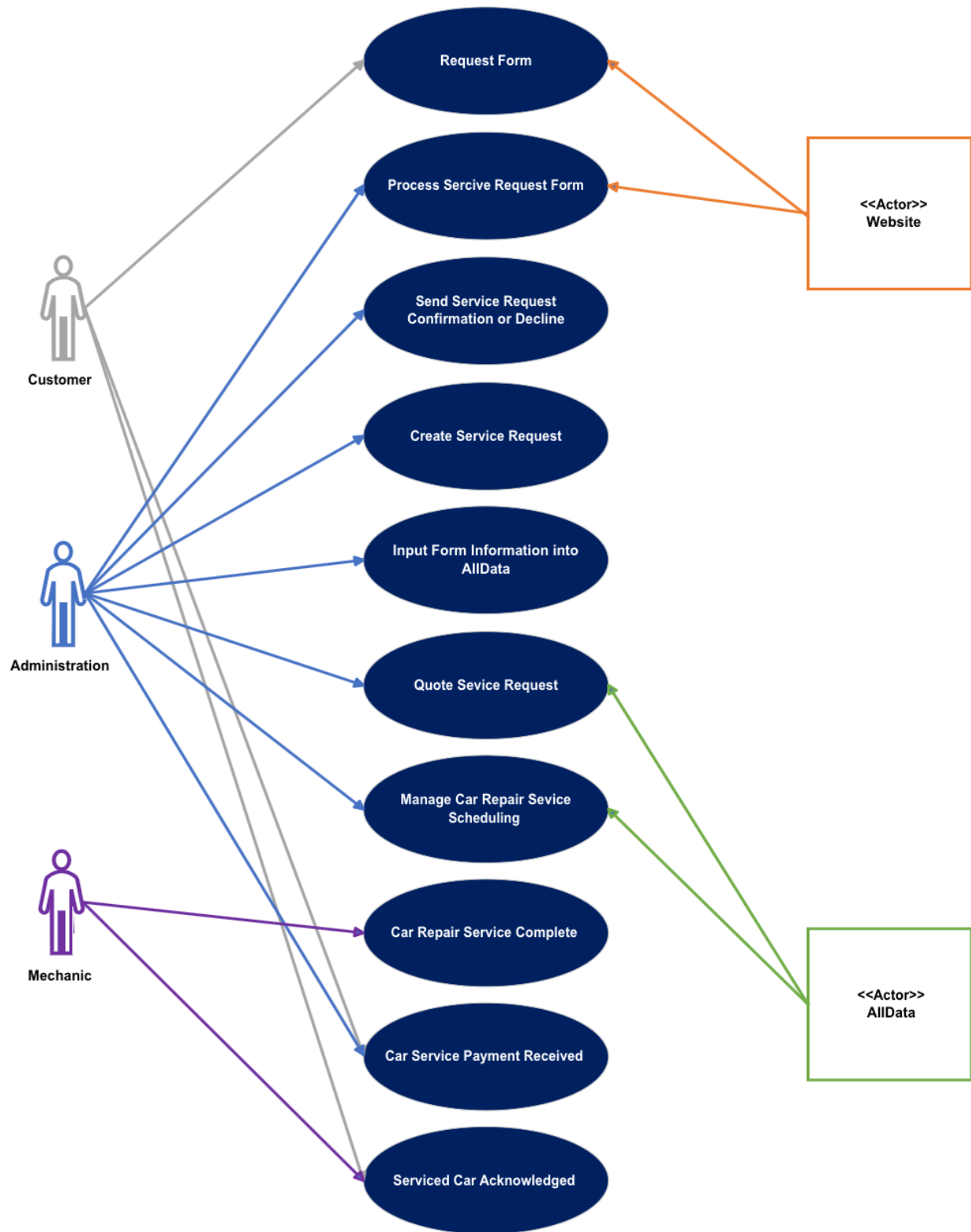
Executive Summary with Narrative and Conclusions

This section includes an updated Use-Case Diagram and a table of the non-functional requirements for our information system for Michael's Auto Service Centers.

The Use-Case diagram illustrates the interactions of the main actors in the system and the 10 main processes involved. Displayed is the mechanic, the customer, and the administrator as the main actors and how we envision the small shop's interaction with the newly proposed information system. The Context Diagram depicts the flow of services from the website to the entities of the customer, the website, the mechanic, and the AllData system. The supplemental specifications describe the non-functional requirements for the system.

We've also adjusted the goals and structure of our information system to better serve Michael's Auto Service Centers. Our new system will focus more on the actual gathering of client information to better assist with the scheduling process for the small shop. We envision these system changes to provide better efficiency for Mr. Bavaro and to allow potential clients more access to the shop's services.

Use Case Diagram



Supplement Specifications

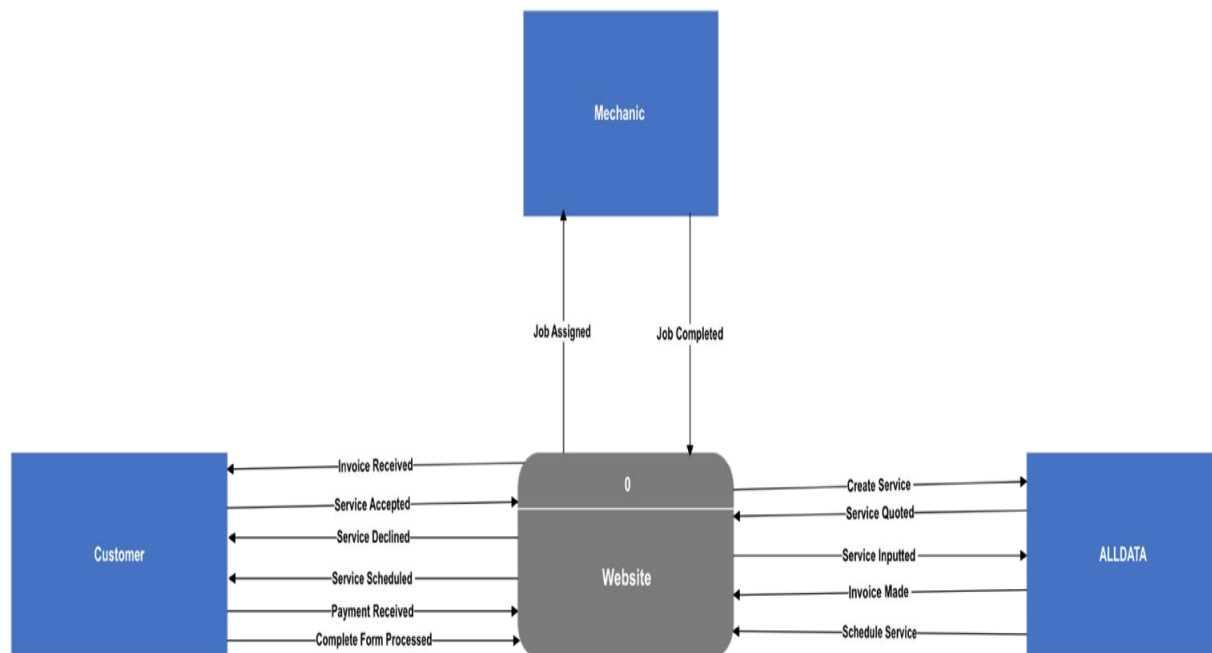
Nonfunctional Requirements	
Operational	<ul style="list-style-type: none">• System should be supported on all internet browsers.• Accessible by mobile devices.• System must run on multiple Operating systems.• System must export request form to Michael's email.
Performance	<ul style="list-style-type: none">• All site functionality is available within 3 clicks for outside Users.• The system should be prepared to allow at least 10 outside Users to operate the system at any given time.• The system should process the request form in 2 minutes and send it to Michael's email.
Security/Privacy	<ul style="list-style-type: none">• System will secure User contact information from unwanted access and/or outside threats.• Personable identifiable information and sensitive data should only be accessible by business management.• The owner is the only person with access to the system's backend.• The owner is the only person with access to viewing customer request forms for approval.
Cultural	<ul style="list-style-type: none">• Website design aligns with standard cultural web design elements of small North American businesses.• The system will only use photos taken by the owner.
Political	<ul style="list-style-type: none">• A customer's personal and financial information is protected in compliance with local/state laws and the federally mandated Data Protection Act.

Section 3. Analysis

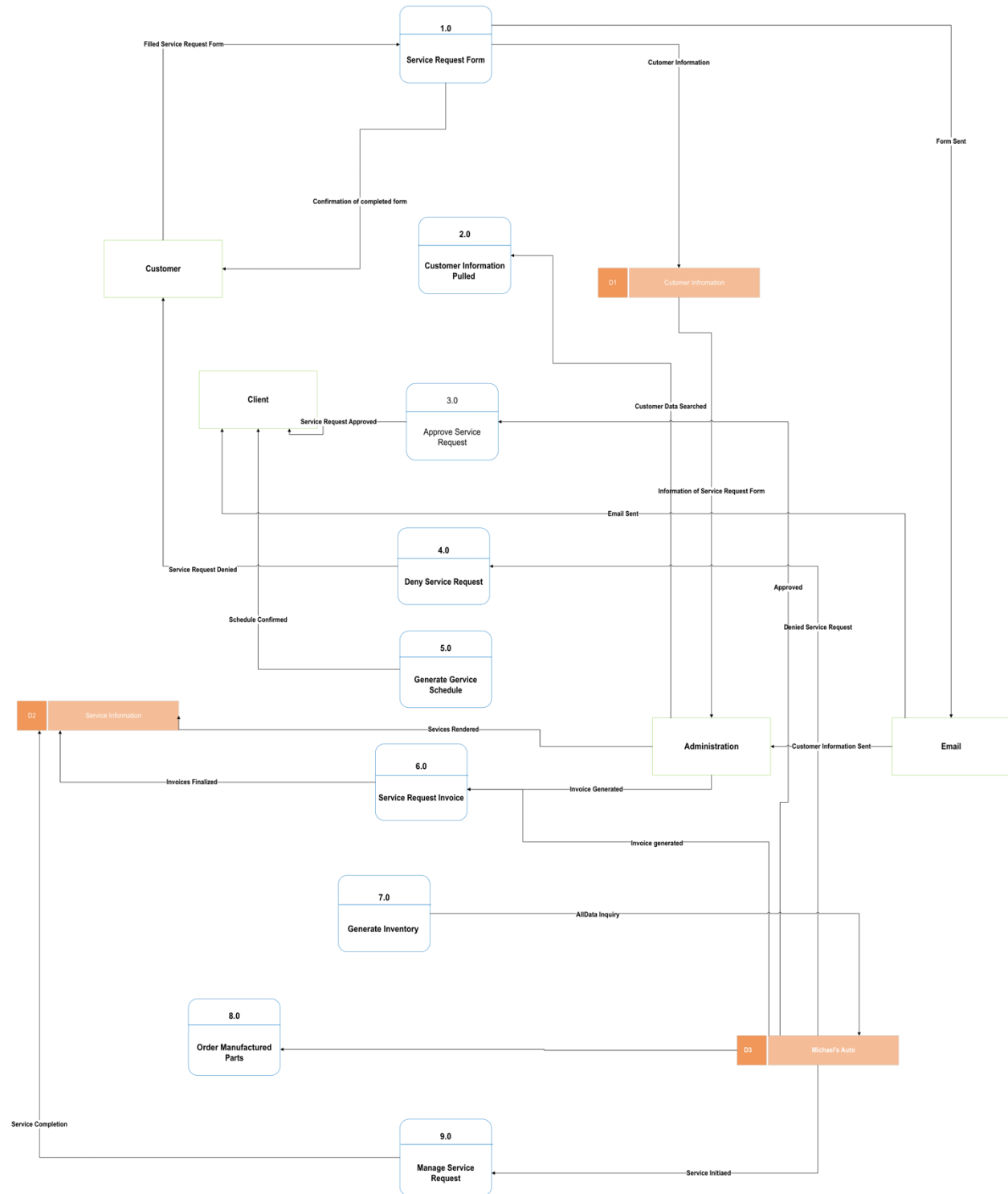
Executive Summary and Conclusion

This section introduces and shows the Data Flow Diagram (DFD) package, the Hardware and Software requirements, the Navigation Diagram, the Physical Entity-Relationship Diagram (ERD), and the Input, Process, and Output (IPO) Chart. Within the DFD package, there shows level 0 and the main process that illustrates the flow through the entities and the data stores within the system. There is also included the level 1 DFD. There was a discussion in which we showed the importance and complexities of our system and thus the processes are clarified in the DFDs shown. The Hardware and Software requirements include the basic hardware and software that Michaels Auto employees will need to access, manage, and process the system. The Navigation Diagram is framed to demonstrate ease of access for the system and the corresponding components. The ERD is how the database is organized and the relationships between the different tables that are shown within. The IPO chart demonstrates how the input and output is delivered.

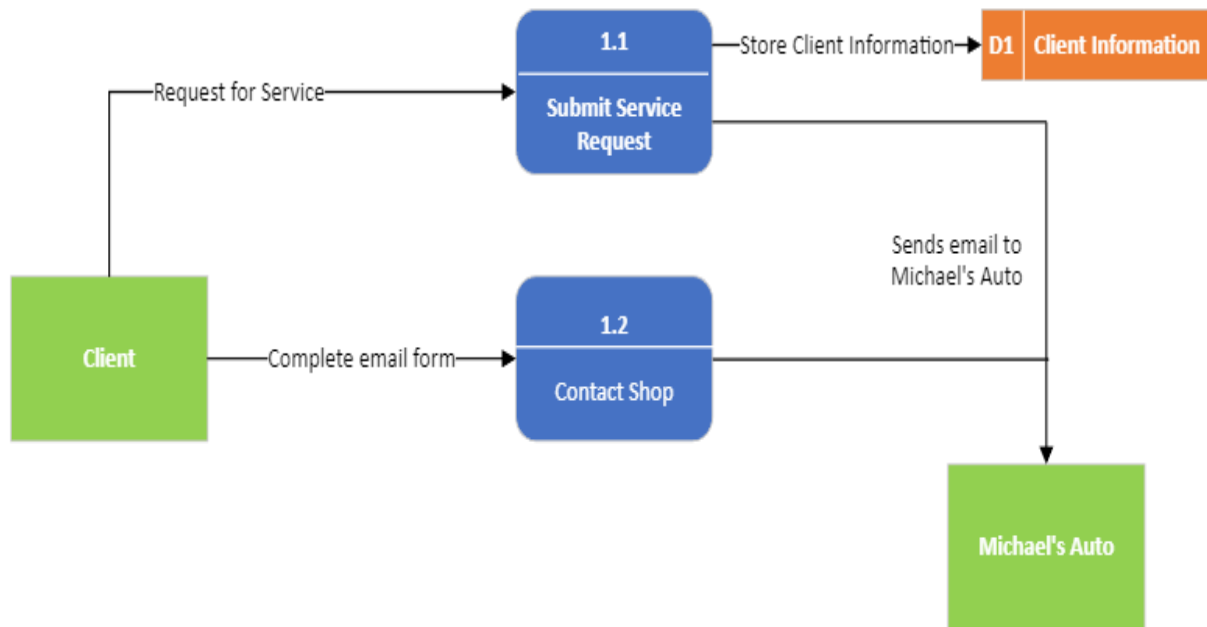
DFD Package Context Diagram



Data Flow Diagram Level 0



Data Flow Diagram Level 1



Hardware and Software Specifications

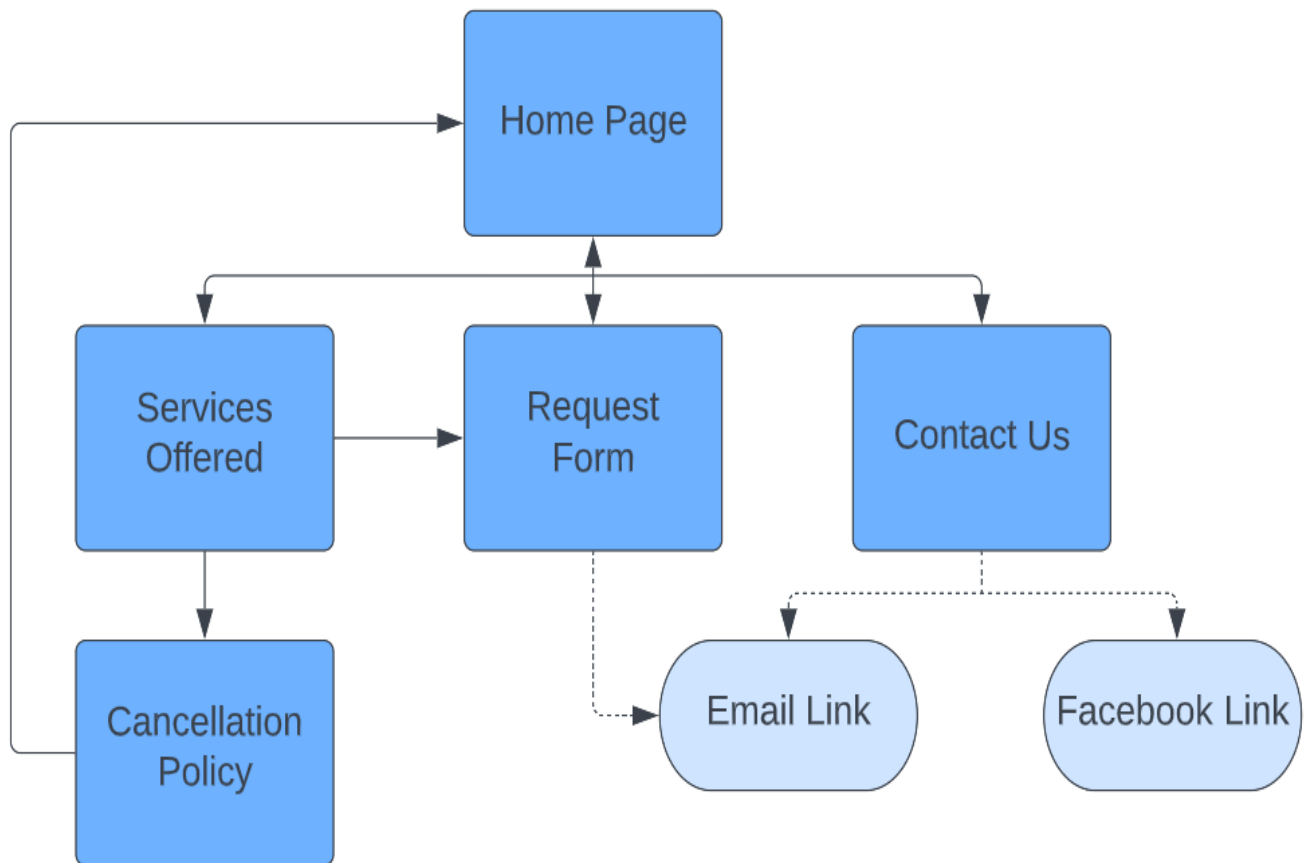
Hardware

- Device capable of accessing the internet to manage site.
- A device such as a desktop, laptop, or tablet that can access the internet.
- Wi-Fi router

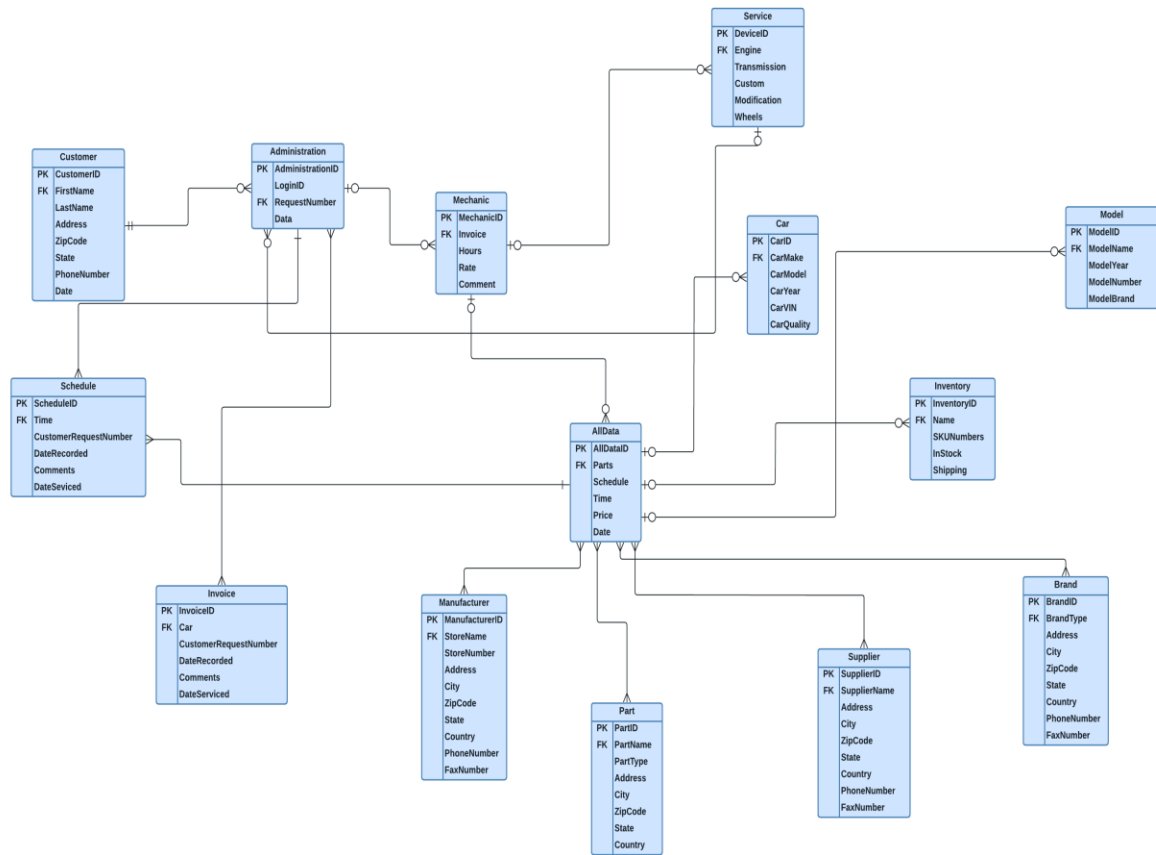
Software

- Windows or Apple operating system to access and manage system.
- Internet Browser to access internet.
- Domain subscription to keep URL active.

Navigation Diagram



Physical Entity-Relationship Diagram



Program Plan

Our proposed information system will be designed to offer a landing page for potential and current customers to review Michael's Auto Service Center shop hours and contact information, services offered, and most importantly, a form to request and submit service requests. The website will be hosted on a service of Michael's choosing (based upon cost and needs) where it will be available to anyone with a desktop or mobile device with internet service. The website will feature a user-friendly navigation bar along the top right-hand portion of the site, allowing quick access to any of the informational pages. Among the various pages, visitors will have the ability to submit requests for service via a standardized questionnaire designed by Mr. Bavaro or contact Michael's Auto Service directly via email. The website will also sport a direct link to the shop's Facebook page.

Function:	Input ->	Process ->	Output ->
Service Request	1) User navigates to Michael's Auto website via computer or mobile device 2) User selects "Request Service" from Home Page 3) User completes "Service Request Form" 4) User selects "Submit"	1) Program confirms all required information is present 2) Email Form is processed	1) User inputs are stored for review and record-keeping with Michael's Auto 2) Email to Michael's Auto business email
Email Michael's Auto	1) User navigates to Michael's Auto website via computer or mobile device 2) User selects "Contact Us" from Home Page 3) User selects "Email" 4) User completes "Email Form" 5) User selects "Send"	1) Program confirms all required information is present 2) Email Form is processed	1) Email to Michael's Auto business email
Navigate to Michael's Auto Facebook Page	1) User navigates to Michael's Auto website via computer or mobile device 2) User selects "Contact Us" from Home Page 3) User selects "Facebook" link	1) "Facebook" link sends User to Michael's Auto Facebook Page	1) User arrives at Michael's Auto Facebook Page